



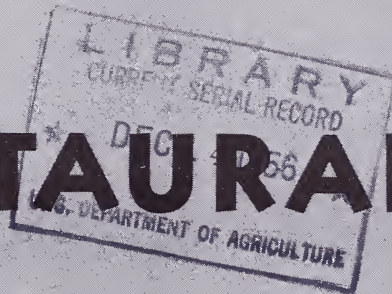
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The use of

FROZEN FOODS by RESTAURANTS



MARKETING RESEARCH
REPORT NO.144

**Marketing Research Division
Agricultural Marketing Service
UNITED STATES DEPARTMENT OF AGRICULTURE
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SUMMARY

This study presents information regarding present usage of selected frozen foods by restaurants and some of the factors which will influence future usage.

1. Of the 6 major vegetables for which information was obtained, restaurants purchased a larger than average proportion in frozen form. The proportion of vegetables purchased in fresh form was considerably less than purchased by the overall market, while the proportion in canned form was equal to that of the overall market. Restaurants purchased a much higher proportion of 4 fruits in frozen and canned form than the proportion purchased in the overall market. Any shift in meals from homes to restaurants should tend to increase the relative share of frozen products.

A relatively large number of the sample restaurants did not use many of the major vegetables in any form. Only 43 percent of the restaurant operators stated that they generally used frozen vegetables; 37 percent said they generally used frozen fruit. The limited use of fruits and vegetables appeared to be associated with the type of meals served.

2. Of the volume of 17 selected vegetables purchased by the 462 restaurants supplying information, 31.2 percent was in frozen form, 38.4 percent in canned form, and 30.4 percent in fresh form. These averages are not representative for specific vegetables. There appears to be more competition between fresh and frozen vegetables than between canned and frozen.

The average purchases of fruits and berries (apples, cherries, peaches, and strawberries) were about equally distributed among frozen, fresh, and canned forms. On an individual commodity basis, restaurants purchased more of their apples in fresh form, more of their cherries and strawberries in frozen form, and more of their peaches in canned form.

Frozen orange juice concentrate accounted for 71.4 percent of the orange juice served in the restaurants; 23.1 percent was squeezed from fresh oranges; and 5.5 percent was canned.

Restaurants purchased only about one-fifth of their chickens in frozen form, but slightly more than two-thirds of their turkeys in frozen form.

3. In giving reasons for using frozen vegetables, 66 percent of the restaurant operators mentioned the advantages of convenience at least once, 62 percent mentioned quality advantages at least once, and 42 percent mentioned factors associated with cost at least once.

4. Size of establishments appears to have a definite influence on the form in which fruits, vegetables, and orange juice are purchased. The larger restaurants (12 or more employees) purchased 37.0 percent of their vegetables in frozen form compared with only 11.5 percent for the smaller restaurants (6-11 employees). A similar pattern also held for frozen fruit.

It appears that the restaurants serving meals priced at \$1 and over used a higher proportion of fruits and vegetables in frozen form as compared with the proportion used by restaurants serving lower priced meals (under \$1). Those serving the lower priced meals purchased a higher proportion of vegetables in fresh form than those serving the higher priced meals.

5. There was wide regional variation in the form in which fruits and vegetables were purchased by restaurants. Those in the North Atlantic States purchased the greater share of their fruits and vegetables in fresh form. The establishments in the East and West North Central States purchased the greater share of fruit in frozen form and their vegetables in canned form. Those in the South Atlantic and East and West South Central

regions purchased both fruits and vegetables predominantly in canned form. This was not representative for individual commodities.

During the season in which fruits and vegetables are readily available in fresh form, restaurant purchases in this form, of course, were relatively large. There was considerable seasonal variation among individual items.

6. If the 1948 pattern of meals purchased away from home remains unchanged, and population and income rise as expected, there should be an increase of about 75 percent in the number of meals purchased away from home by 1975. Of this increase, 57 percent may be attributed to the increase in population and 43 percent to the increase in disposable income. With an estimated increase in meals purchased away from home based on these assumptions, the frozen vegetable pack in institutional-sized containers might be expected to increase to 366 million pounds--an increase of 158 million pounds over that packed in this category in 1953. For fruits it should mean an institutional market of 52 million pounds, an increase of 23 million pounds over the 1953 pack. Even further increases may be expected with a continuation of the trends toward higher priced meals, larger restaurants, and portion-controlled foods.

THE USE OF FROZEN FOODS BY RESTAURANTS

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BACKGROUND AND PURPOSE OF STUDY

The production of frozen foods has more than tripled since World War II and promises to continue to increase for some time to come. What will this rapid growth of the frozen food industry mean to future marketing practices in the food industry as a whole?

The Agricultural Marketing Service has undertaken studies designed to shed light on the changes which are taking place in each major food outlet. It has been necessary to survey intensively each segment of the food industry using frozen foods. This report presents the results of a survey of the use of frozen foods by the restaurant industry.

About 23 percent of the consumer's food dollar was spent on meals eaten away from home in 1948.¹ According to the 1948 Census of Business 80 percent of the meals served by public eating places in the United States were in restaurants and cafeterias.² The restaurant industry represents a sizable market for food products.

The study was designed to provide at least partial answers to the following questions:

1. To what extent do restaurants and cafeterias provide a market for frozen fruits and vegetables?
2. How does the volume of frozen items purchased compare with the volume of fresh and canned items purchased by restaurants and cafeterias?
3. What is the restaurant industry's attitude toward the use of frozen fruits, vegetables, juices, and poultry?
4. Do size of restaurant and price of meal influence the use of frozen foods by restaurants?
5. Is there a seasonal pattern in restaurant purchases of frozen foods, and are there regional differences in the use of frozen foods by restaurants?
6. What effect would an increased number of meals eaten in restaurants have upon the frozen food industry?

PROCEDURE

The findings of this report are based upon a random sample of eating places having 6 or more employees in 3 regions of the United States (I, II and III, fig. 1). The 3 regions accounted for 83 percent of the total sales of meals³ by restaurants and cafeterias⁴ and 87 percent of the total population. This was used as the basis for excluding region IV from the study.

Figure 1 shows there is a fairly close relationship between density of population and the number of meals sold outside the home within a region. However, this relationship

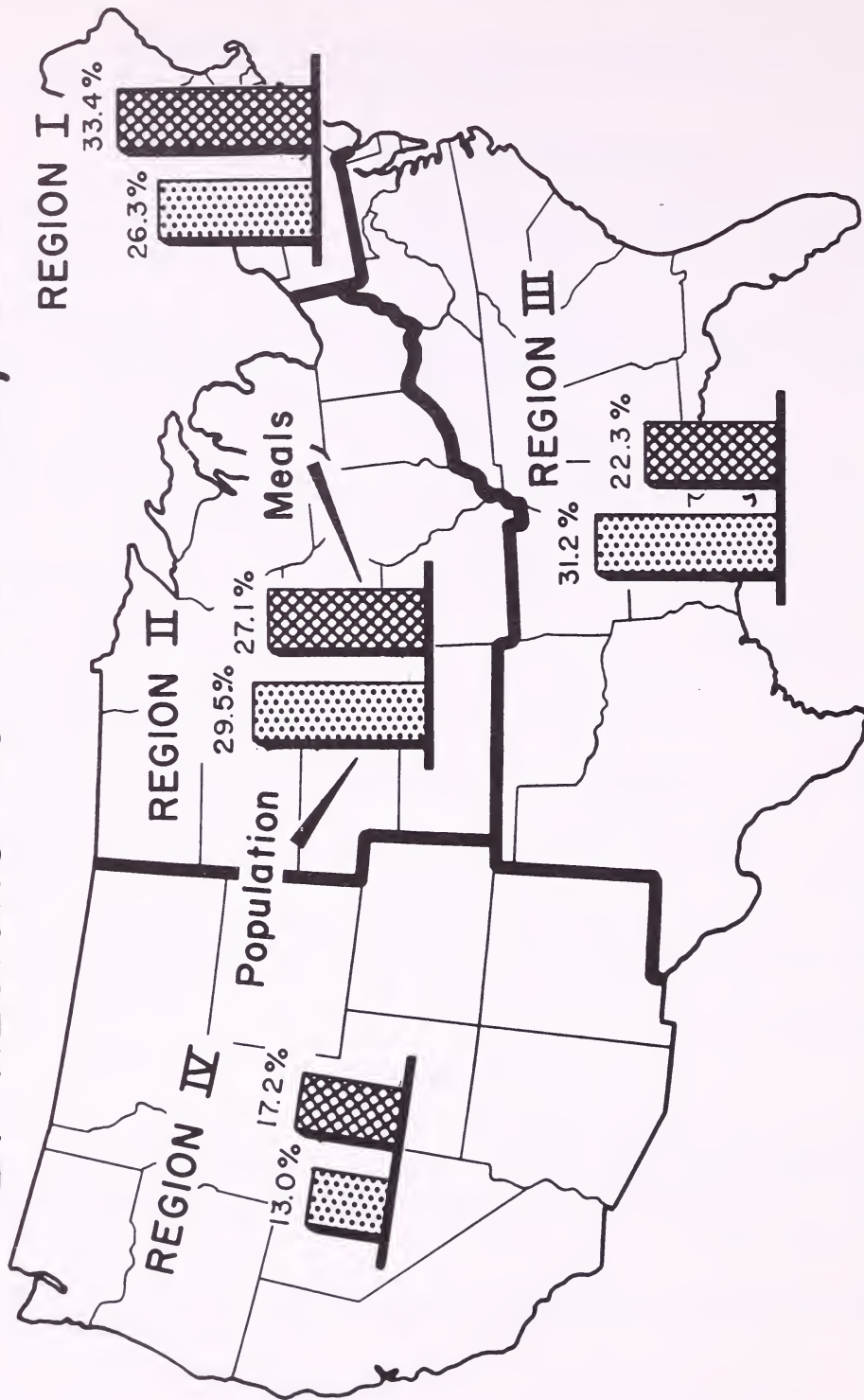
¹ Sartorius, L. C. and Burk, M. C., in cooperation with Univ. of Minn. Eating Places as Marketers of Food Products. U. S. Dept. Agr. Mktg. Res. Rpt. 3, 1952.

² Meals served by other public eating places include those served by lunch counters, refreshment counters, and by caterers.

³ 1948 Census of Business, Retail Trade.

⁴ Restaurants and cafeterias hereafter are referred to as restaurants.

MEALS IN RESTAURANTS AND POPULATION, BY REGIONS AS % OF U.S., 1948



SOURCE: 1948 CENSUS OF BUSINESS STATISTICAL ABSTRACT OF THE UNITED STATES 1953

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NEG. 1479 - 55 (2)

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FIGURE 1

varies between regions: for example, region I (New England and Middle Atlantic States) accounts for the largest share of meals sold in restaurants even though both regions II (East and West North Central) and III (South Atlantic and East and West South Central) have a larger share of the total population.

A sample of 24 cities was selected within the 3 regions on the basis of population. (See appendix for sample design.) Within each city a sample of restaurants was selected on the basis of size as measured by the number of employees: (1) Those with 6-11 employees, and (2) those with 12 or more employees. The 2 size groups were selected since together they represent only 25.6 percent of the total number of eating establishments, but account for 65.5 percent of the total dollar volume of the sales of eating places.⁵ Table 1 shows the percentage distribution of establishments and value of sales of eating places grouped according to size grouping of employees by regions.

From this sample, 588 restaurant operators were interviewed during August of 1954 to obtain their attitudes toward the use of frozen vegetables, fruits, juices, and poultry. Each operator was asked his reason for using or not using these products. In addition, detailed purchase information for the fruits, vegetables, juices and poultry items that are customarily available in frozen form was obtained from 462 of the same restaurants for two 4-week periods in August and November 1954. Information showing the quantities of selected food items purchased in frozen form as well as for their fresh and canned counterparts was obtained for items within each category. These data were converted to fresh weight equivalent basis for each commodity in order to make direct comparisons as to the relative importance that each form was of the total for that commodity.

The 4-week periods in August and November were selected for study because August is considered to be representative of spring or summer months and November is considered to be representative of fall or winter months in regard to the availability of fresh items.

Table 1.--Percentage distribution of establishments and value of sales of eating places by specified number of employees, by regions, 1948^{1 2}

Employees in establishment	Region I		Region II		Region III		Region IV		All regions	
	Es-tab-lish-ments	Sales	Es-tab-lish-ments	Sales	Es-tab-lish-ments	Sales	Es-tab-lish-ments	Sales	Es-tab-lish-ments	Sales
	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
5 and under.	74.6	33.0	71.6	34.5	76.9	37.0	73.8	33.3	74.4	34.5
6-11.....	12.6	16.2	16.7	22.0	14.0	23.2	13.8	18.9	14.3	19.7
12 or more.	12.8	50.8	11.7	43.5	9.1	39.8	12.4	47.8	11.3	45.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

¹ 1948 Census of Business.

² Figure 1 (map) shows the boundaries of the 4 regions in the United States.

FINDINGS

The findings of this report are based on actual records of purchases⁶ of selected fruits, vegetables, juices, and poultry by the restaurants and cafeterias in the sample. The proportion of selected commodities purchased in fresh, frozen, and canned forms

⁵ 1948 Census of Business, Retail Trade.

⁶ The terms "purchases" and "usage" are used interchangeably throughout this report.

are shown separately on a fresh weight equivalent basis. This information is presented according to 2 time periods during the year, size of establishment, price of meal, and regional location. In order to present the pattern of frozen food usage by the restaurant industry more clearly, each major frozen food category will be examined separately--vegetables, fruits and berries, juices, and poultry. Limited data for meats are presented.

Vegetables

Almost two-thirds of the frozen vegetable output is packed in small units (below 1 pound) for sale to consumers through retail stores. Of the remaining one-third, packed in units of more than 1 pound, about one-half is packed for the institutional market--restaurants, cafeterias, hotels, hospitals, institutions, etc. The other half either goes to remanufacturers (soup makers, prepared food manufacturers, etc.) or is repacked in small containers as vegetable mixtures. The findings of this report relate to the restaurant and cafeteria market only.

RESTAURANT PURCHASES IN COMPARISON WITH CIVILIAN DISAPPEARANCE

Restaurants purchased relatively more of 6 selected vegetables in frozen form,¹ a smaller proportion in fresh form, and about the same proportion in canned form as the national averages² for these same vegetables. Table 2 shows the civilian disappearance for 1954 by fresh, frozen, and canned forms, for each of 6 vegetables, and the average restaurant purchases during August and November 1954.

With the exception of sweet corn and green beans, restaurants purchased relatively more vegetables in frozen form than they did in fresh form. Restaurants purchased 4 out of the 6 vegetables predominantly in canned form.

Table 2. --Percentage distribution of restaurant purchases and civilian disappearance of specific vegetables, by frozen, fresh, or canned form, specified dates¹

Vegetable	1954					
	August and November purchases by restaurants			Civilian disappearance ²		
	Frozen	Fresh	Canned	Frozen	Fresh	Canned
	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Sweet corn	22.1	24.2	53.7	7.4	36.1	56.5
Green beans	16.0	22.5	61.5	10.8	53.8	35.4
Green peas	45.2	.9	53.9	31.2	3.2	65.6
Spinach	45.1	32.7	22.2	36.2	39.1	24.6
Lima beans	64.0	10.0	26.0	59.3	12.3	28.4
Asparagus	35.7	.4	63.9	15.2	38.1	46.7
Average	30.6	19.3	50.1	18.2	29.6	52.2

¹ Based on fresh weight equivalent.

² "The Vegetable Situation", 1956 Outlook issue, U. S. Dept. Agr.

NUMBER OF RESTAURANTS PURCHASING VEGETABLES

A relatively large number of the 462 restaurants supplying information used only a few of the major vegetables in any form. The number of restaurants using vegetables

¹ Includes sweet corn, green beans, green peas, spinach, lima beans, and asparagus, in order of importance.

² National average, total domestic market, over all market and civilian disappearance are synonymous.

during August ranged from 68.8 percent for green peas and green beans down to only 13.6 percent for asparagus (table 3). The range in number of restaurants using the same vegetables during November varied from 77.7 percent for green peas to only 14.7 percent for asparagus.

Eleven vegetables for which data were obtained in this survey include, in order of volume purchased: Sweet corn, green beans, green peas, spinach, broccoli, carrots, lima beans, cauliflower, leafy greens (other than spinach), asparagus, and mixed vegetables. Table 3 might seem to indicate that there is a sizable untapped restaurant market for most of the 11 vegetables. However, there are barriers that prevent full realization of this potential market. For instance, some restaurants specialize in seafoods and steaks, and serve a very limited selection of vegetables--such as french-fried potatoes and coleslaw. In addition, there are restaurants that specialize in foreign cuisine and serve only a few vegetables. The fact that such a large number of restaurants use relatively few of the major vegetables cannot be overlooked when attempting to appraise the market for any of the forms in which each is regularly available.

A greater proportion of the restaurants used sweet corn, green beans, green peas, spinach, and asparagus in the canned form than used fresh or frozen forms. More restaurants used broccoli, lima beans, and mixed vegetables in the frozen form than in any other form. Carrots and leafy greens were used mostly in the fresh form. These relationships held for both August and November. However, more restaurants used cauliflower in frozen form in August and more used it in the fresh form in November.

More restaurants purchase fresh vegetables during the season the fresh form is readily available than at any other time of the year. This is illustrated by the relatively larger number purchasing fresh sweet corn, green beans, and lima beans in August than in November; and by the relatively larger number purchasing fresh spinach, broccoli, cauliflower, and leafy greens in November than in August.

Table 3. --Percentage of restaurants purchasing specific vegetables, by form, August and November 1954¹

Vegetable	Any form		Frozen		Fresh		Canned	
	Au-gust	Novem-ber	Au-gust	Novem-ber	Au-gust	Novem-ber	Au-gust	Novem-ber
	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Sweet corn	65.2	61.9	13.6	18.4	26.8	4.3	38.7	47.4
Green beans	68.8	71.0	13.0	14.5	21.6	16.9	45.9	52.2
Green peas	68.8	77.7	26.4	31.8	3.9	1.5	48.3	55.6
Spinach	43.7	51.9	19.0	19.3	9.7	15.2	20.3	22.9
Broccoli	21.0	25.1	19.7	19.9	2.4	5.8	---	---
Carrots	53.2	60.6	2.4	2.8	39.6	49.1	17.3	16.7
Lima beans	42.6	42.6	24.0	28.1	7.1	4.1	16.0	14.5
Cauliflower	21.0	27.9	14.5	12.8	7.1	15.8	---	---
Leafy greens ²	16.2	22.7	3.7	4.1	7.8	14.1	5.8	9.1
Asparagus	13.6	14.7	5.8	6.3	0	0.6	8.2	8.4
Mixed	14.1	16.0	6.5	9.7	2.4	0.2	5.2	6.1

¹ Percentage of restaurants purchasing by form when added do not necessarily equal the percentage of restaurant purchases in any form owing to multi-form purchases within either month.

² Leafy greens include kale, collards, and turnip greens.

WHICH FORM WAS USED THE MOST BY RESTAURANTS?

Restaurants used more vegetables in canned form than in either fresh or frozen forms. Canned vegetables accounted for about 38.4 percent of all purchases of the 11 major

vegetables included in this study. Comparable percentages for frozen and fresh vegetables were 31.2 and 30.4, respectively (table 4).

There was an extremely wide variation in the form in which specific vegetables were purchased by restaurants. Eighty-five percent of the broccoli used by restaurants were frozen; only about 4 percent of the carrots. Restaurants used more than 60 percent of their broccoli, lima beans, and cauliflower in frozen form. These 3 vegetables were the only ones used in frozen form to this extent. Restaurants used more than 50 percent of their sweet corn, green beans, green peas, and asparagus in canned form. Carrots and leafy greens were the only vegetables of which more than half was used in fresh form.

Table 4.--Proportion of restaurants using specific vegetables in any form and the relative proportion of the same purchased by restaurants, by form, average for August and November 1954

Vegetable	Proportion of restaurants using in any form	Percentage purchased ¹		
		Frozen	Fresh	Canned
	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Sweet corn	64	22.1	24.2	53.7
Green beans	70	16.0	22.5	61.5
Green peas	73	45.2	0.9	53.9
Spinach	48	45.1	32.7	22.2
Broccoli	23	85.0	15.0	0
Carrots	57	3.9	74.3	21.8
Lima beans	43	64.0	10.0	26.0
Cauliflower	24	67.4	32.6	0
Leafy greens ²	19	23.3	52.1	24.6
Asparagus	14	35.7	0.4	63.9
Mixed	15	44.3	10.2	45.5
Miscellaneous ³	(4)	25.1	65.5	9.4
Average		31.2	30.4	38.4

¹ Based on fresh weight equivalent.

² Leafy greens include kale, collards, and turnip greens.

³ Includes brussels sprouts, okra, field and blackeyed peas, squash, and succotash.

⁴ Information not available.

The relative quantities of specific frozen, fresh, and canned vegetables purchased by restaurants during August and November 1954 are shown in table 5. The largest proportion of the vegetables was purchased in canned form during both months. This held true for 4 of the individual commodities--Sweet corn, green beans, green peas, and asparagus. However, spinach, broccoli, lima beans, and cauliflower were purchased predominantly in frozen form during both months, while the highest proportion of carrots and leafy greens was purchased in fresh form. Mixed vegetables were purchased predominantly in canned form in August and in frozen form in November.

VARIATION IN QUANTITIES PURCHASED BETWEEN AUGUST AND NOVEMBER

Slightly larger quantities of vegetables were used by the sample restaurants during August than during November (table 6). The index for vegetables purchased dropped from 100 for August to 97 for November. This generalization does not hold for the individual vegetables.

The quantities of green beans, green peas, spinach, broccoli, cauliflower, leafy greens, and mixed vegetables purchased in all forms increased during November, while

Table 5.--Relative quantities of frozen, fresh, and canned selected vegetables purchased by restaurants, August and November 1954¹

Vegetable	Frozen		Fresh		Canned	
	August	November	August	November	August	November
	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Sweet corn.....	17.6	29.0	38.2	2.3	44.2	68.7
Green beans.....	13.1	18.8	27.5	17.7	59.4	63.5
Green peas.....	41.0	49.2	1.3	.6	57.7	50.2
Spinach.....	46.5	44.2	27.6	36.1	25.9	19.7
Broccoli.....	92.0	78.9	8.0	21.1	---	---
Carrots.....	4.7	3.0	73.3	75.4	22.0	21.6
Lima beans.....	57.3	72.7	13.0	6.0	29.7	21.3
Cauliflower.....	76.2	60.0	23.8	40.0	---	---
Leafy greens ²	34.7	14.9	46.3	56.3	19.0	28.8
Asparagus.....	33.8	38.1	---	.9	66.2	61.0
Mixed.....	28.6	54.5	21.3	3.0	50.1	42.5
Miscellaneous ³ ...	32.5	21.4	56.4	70.1	11.1	8.5
Average.....	29.0	33.5	33.3	27.5	37.7	39.0

¹ Based on fresh weight equivalent.

² Leafy greens include kale, collards, and turnip greens.

³ Includes brussels sprouts, okra, field, and blackeyed peas, squash, and succotash.

the quantities of sweet corn, carrots, lima beans, and asparagus decreased in November. The index of the purchases of vegetables for November compared with that for August (index = 100) ranged from a low of 63.8 for sweet corn to as high as 153.1 for mixed vegetables.

A larger quantity of frozen vegetables was used by the sample restaurants during November than during August. This increase appears to be at the expense of fresh vegetables, since the purchases of canned vegetables appear to have remained at about the same level during both months.

There was a wide variation in the form in which individual vegetables were purchased during August and November. This can be illustrated by the purchases of sweet corn where the total quantity used decreased to an index of 63.8 during November. The quantity used in frozen form increased only 5 points and that in canned form remained at about the same level. However, sweet corn used in fresh form decreased to an index of only 3.8. This is due to the fact that fresh corn-on-the-cob is not generally available during November. The purchases of fresh corn were not offset by increased purchases of canned corn and only to a limited extent by purchases of frozen corn.

In the case of green beans and green peas, total purchases during November were only slightly higher than those for August. Purchases of frozen peas were higher resulting in a decrease in purchases of both canned and fresh peas, and purchases of frozen green beans were higher at a decrease in purchases of fresh green beans only.

The purchases of spinach were higher in all forms (fresh, frozen, and canned) during November. The total purchases of the fall vegetables--such as broccoli, cauliflower, and leafy greens--were much higher during November, compared with purchases in August. However, this was mainly due to larger purchases in fresh form at the expense of frozen and canned forms, with the exception of purchases of leafy greens which also increased in canned form.

Table 6. --Index numbers of quantity of selected vegetables purchased by restaurants, by form, November, 1954¹

[August 1954 = 100]

Vegetable	All forms	Frozen	Fresh	Canned
Corn	63.8	105.1	3.8	99.3
Green beans.....	103.4	148.7	66.5	110.5
Peas	102.8	123.4	44.3	89.5
Spinach.....	151.0	143.6	197.0	114.9
Broccoli.....	112.5	96.5	296.0	---
Carrots.....	97.2	61.0	100.1	95.4
Lima beans	77.3	98.1	35.6	55.3
Cauliflower	117.2	92.3	196.7	---
Leafy greens ²	136.3	58.6	165.5	206.7
Asparagus	79.4	89.4	---	73.2
Mixed	153.1	291.3	21.3	129.9
Miscellaneous ³ ...	198.3	130.4	246.5	152.3
Average	97.0	112.2	79.9	100.4

¹Based on fresh weight equivalent.

²Leafy greens include kale, collards, and turnip greens.

³Includes brussels sprouts, okra, field and blackeyed peas, squash, and succotash.

VARIATION IN PURCHASES, BY REGIONS

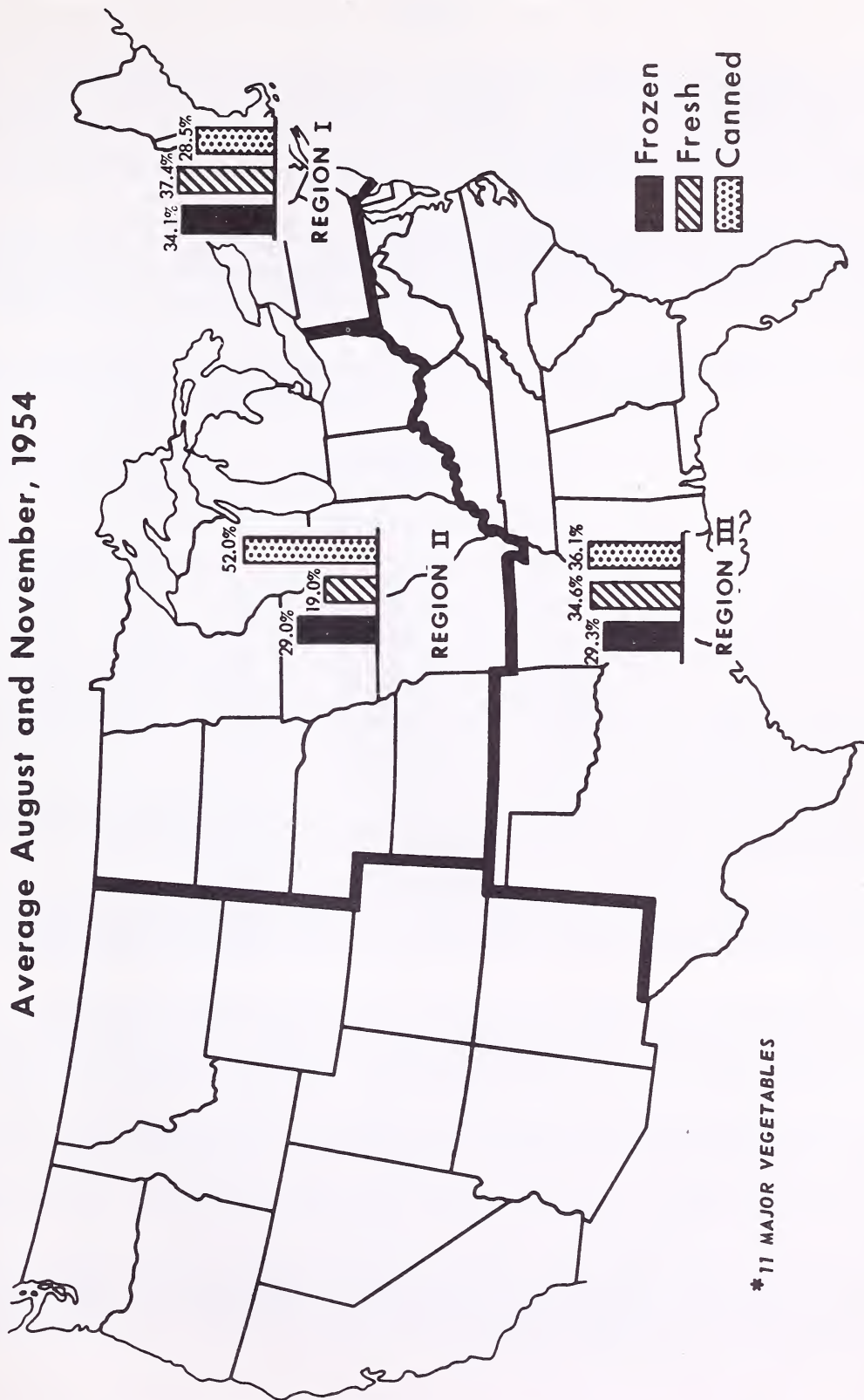
There are relatively wide variations in the form in which restaurants purchase vegetables within the 3 regions covered by this study (fig. 2). In the North Atlantic States (region I) a higher proportion--37.2--of the vegetables were purchased in fresh form; the lowest proportion--28.5--was purchased in canned form. In regions II and III a higher proportion was purchased in canned form--52.0 percent and 36.1 percent, respectively. Fresh vegetables accounted for the smallest share in region II and frozen vegetables for the smallest share in region III.

The regional variation in the form in which restaurants purchase specific vegetables is shown in table 25, Appendix. The wide variation in form that was found is shown by using peas as an example. Considering frozen and canned green peas only, as fresh green peas were relatively unimportant in all regions, the restaurants in region I used at about three-fifths of their green peas in frozen form and about two-fifths in canned form. Restaurants in region II used two-fifths frozen and three-fifths canned, while in region III they used only one-fifth frozen and about four-fifths in canned form.

Green beans serve as another example of regional variation by form. Canned green beans were important in all regions, ranging from 45.9 percent in region I to 81.5 percent in region II. Frozen green beans were important only in region I, while fresh green beans were relatively important in regions I and III. Similar extreme variations were encountered for almost every vegetable in the study.

FORM IN WHICH VEGETABLES* WERE PURCHASED BY RESTAURANTS

Average August and November, 1954



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FIGURE 2

Fruits

More than two-thirds of the fruits and berries that are frozen are packed in containers holding more than 10 pounds. This pack is sold principally to preservers, pie bakers, and ice cream manufacturers. The remaining one-third is sold to restaurants, cafeterias, and other institutional users and to household consumers through retail stores. It is estimated that about one-sixth of this one-third is destined for restaurant and other institutional users--this represents about 6 percent of the total frozen fruit pack.

Restaurants purchase a much higher proportion of their fruits (apples, sour cherries, peaches, and strawberries) in frozen and canned form than is purchased in the total domestic market (table 7). Without exception, for each of the 4 fruits, a larger proportion was purchased in frozen form by the restaurant market than by the overall domestic market.

Table 7. --Percentage distribution of specific fruits purchased by restaurants, and civilian disappearance, by form, specified dates¹

Fruit	Restaurant purchases			Civilian disappearance		
	Frozen	Fresh	Canned	Frozen	Fresh	Canned
	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Apples.....	27.6	40.4	32.0	2.1	78.9	19.0
Sour cherries	77.5	2.9	19.6	22.8	28.8	48.4
Peaches	13.5	34.9	51.6	1.3	62.1	36.6
Strawberries	92.8	4.3	2.9	46.6	53.4	---
Average	33.6	32.6	33.8	5.3	69.0	25.7

¹ Based on fresh weight equivalent.

Restaurant purchases of fresh fruit were 36.4 percentage points less than the proportion consumed as fresh in the total domestic market (table 7).

Restaurants used a slightly higher proportion of canned fruits than was consumed by the market as a whole. This relationship held for apples and peaches, but not for cherries, and was not applicable to strawberries because they are not available in canned form.

To recapitulate, restaurants purchased more of their apples in fresh form, more of their cherries and strawberries in frozen form, and more of their peaches in canned form. However, for overall civilian disappearance, more apples were consumed in fresh form, more cherries in canned form, and more peaches and strawberries in fresh form.

A large number of the restaurants in the study did not use any of the 4 fruits in any form (table 8). The number of restaurants using fruits during August ranged from 48.7 percent for peaches down to 18.8 percent for sour cherries. During November the range was at a somewhat higher level--54.1 percent for apples down to 23.4 percent for strawberries.

As with vegetables, during the season in which fruits are readily available in fresh form, more restaurants purchase the fresh items than they do at any other time of the year. Evidence of this is shown by more restaurants turning to fresh peaches in August and to fresh apples in November (table 9).

Table 8. --Percentage of restaurants purchasing fruits, by form, August and November 1954¹

Fruit	In any form		In frozen form		In fresh form		In canned form	
	Au- gust	Novem- ber	Au- gust	Novem- ber	Au- gust	Novem- ber	Au- gust	Novem- ber
	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Apples.....	38.5	54.1	13.4	11.0	14.9	35.9	15.4	18.8
Peaches	48.7	39.6	7.1	7.8	21.0	.4	30.1	34.6
Sour cherries	18.8	27.7	12.6	16.0	1.1	0.0	6.3	13.0
Strawberries	28.1	23.4	24.7	21.4	1.7	1.3	1.3	1.5

¹Combined percentages of restaurants purchasing by form do not necessarily equal the percentage of restaurants purchasing in any form owing to multiform purchases within either month.

Table 9. --Index numbers of quantity of selected fruits purchased by restaurants, by form, November 1954¹

[August 1954 = 100]

Fruit	All forms	Frozen	Fresh	Canned
Apples.....	157.9	82.9	285.9	142.1
Peaches	46.9	111.7	.2	91.8
Sour cherries	139.6	138.9	0.0	206.6
Strawberries	63.8	67.3	20.0	45.3
Average	109.5	94.4	114.1	122.2

¹Based on fresh weight equivalent.

VARIATION IN PURCHASES, BY REGIONS

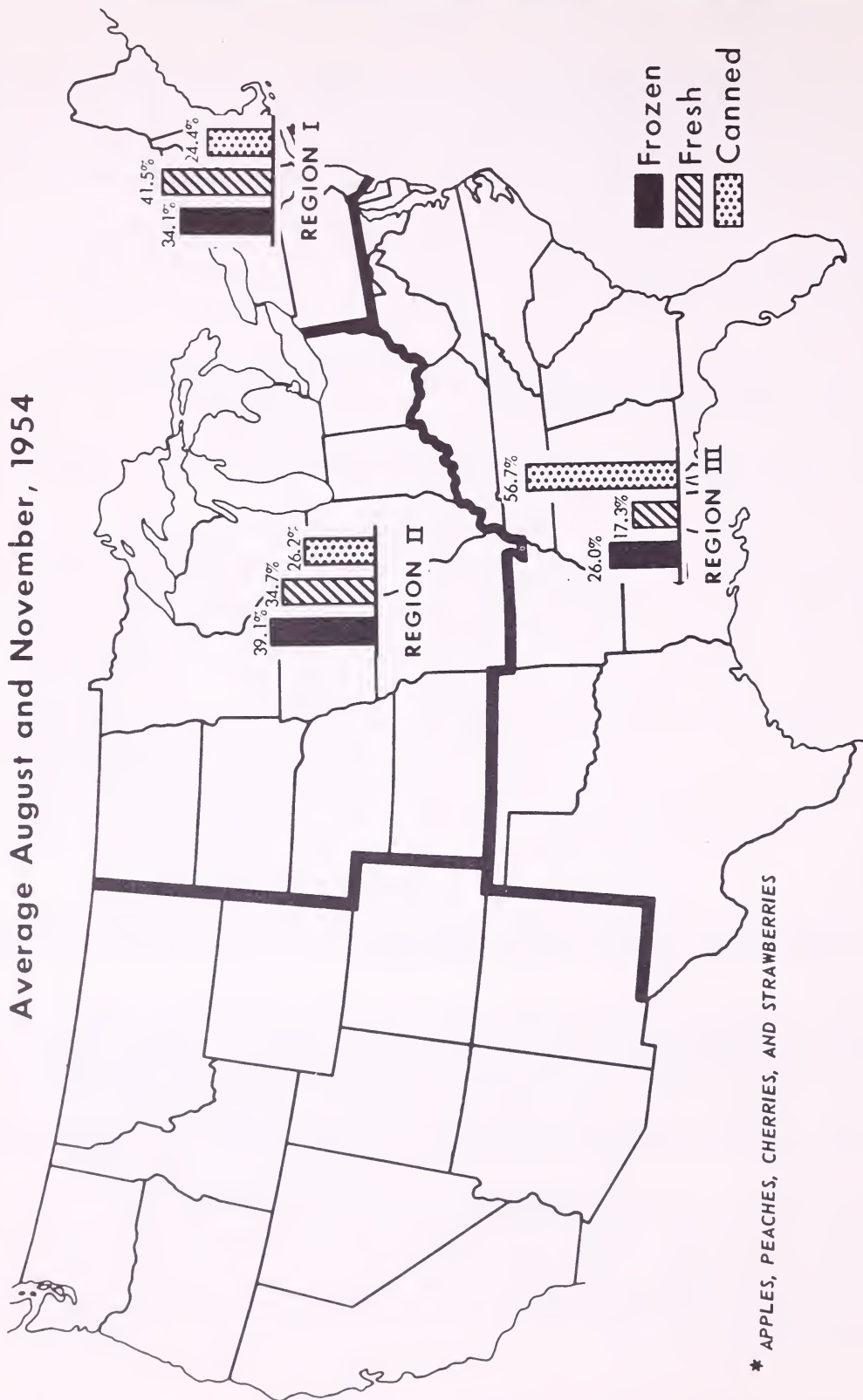
There are wide variations in the form in which restaurants purchase fruit within the 3 geographical regions studied (fig. 3).

Fruits purchased by these restaurants followed a somewhat different pattern than did vegetables. Fresh fruits were of major importance in region I, while canned was of least importance. Restaurants in region II purchased a higher proportion in frozen form, while canned was the least important. However, in region III canned fruits were of major importance and fresh was of least importance. In other words, fresh fruits were predominant in region I, frozen in region II, and canned in region III.

The regional variations in form did not appear to be as great for sour cherries and strawberries as for apples and peaches (table 25, Appendix). Region I tended to use a higher proportion of both apples and peaches in fresh form, while restaurants in region II used a high proportion of their apples in fresh form, but their peaches were predominantly in frozen form. In region III canned peaches and apples were of major importance.

FORM IN WHICH FRUITS* WERE PURCHASED BY RESTAURANTS

Average August and November, 1954



* APPLES, PEACHES, CHERRIES, AND STRAWBERRIES

Juice

The juice referred to in this section is orange juice exclusively. The pack of frozen orange juice concentrate in institutional-sized containers (32 ounce) represents about 10 percent of the total pack of frozen orange juice concentrate.⁹

Restaurants purchased 71.4 percent of their orange juice in frozen form compared with 23.1 percent that was squeezed from fresh oranges.¹⁰ Only 5.5 percent was obtained in canned form.

More orange juice was used by restaurants in August than in November. The index for orange juice decreased from 100 in August to 92.4 in November. The index for both frozen and canned orange juice decreased to 71.9 and 92.9 respectively during November, while juice from fresh oranges increased to an index of 204.5 during November.

Frozen orange juice concentrate accounted for 80 percent of the total orange juice used by the restaurants in August (table 10). In November, it decreased to 62.2 percent of the total as fresh oranges came on the market in plentiful supply in November. The canned orange juice proportion of the total purchased remained 5.4 percent for both months studied.

Table 10. --Relative quantity of frozen, fresh,
and canned orange juice purchased by res-
taurants, August and November 1954¹

Form	August	November
	<i>Percent</i>	<i>Percent</i>
Frozen	80.0	62.2
Fresh	14.6	32.3
Canned	5.4	5.4
Total	100.0	100.0

¹ Based on fresh weight equivalent.

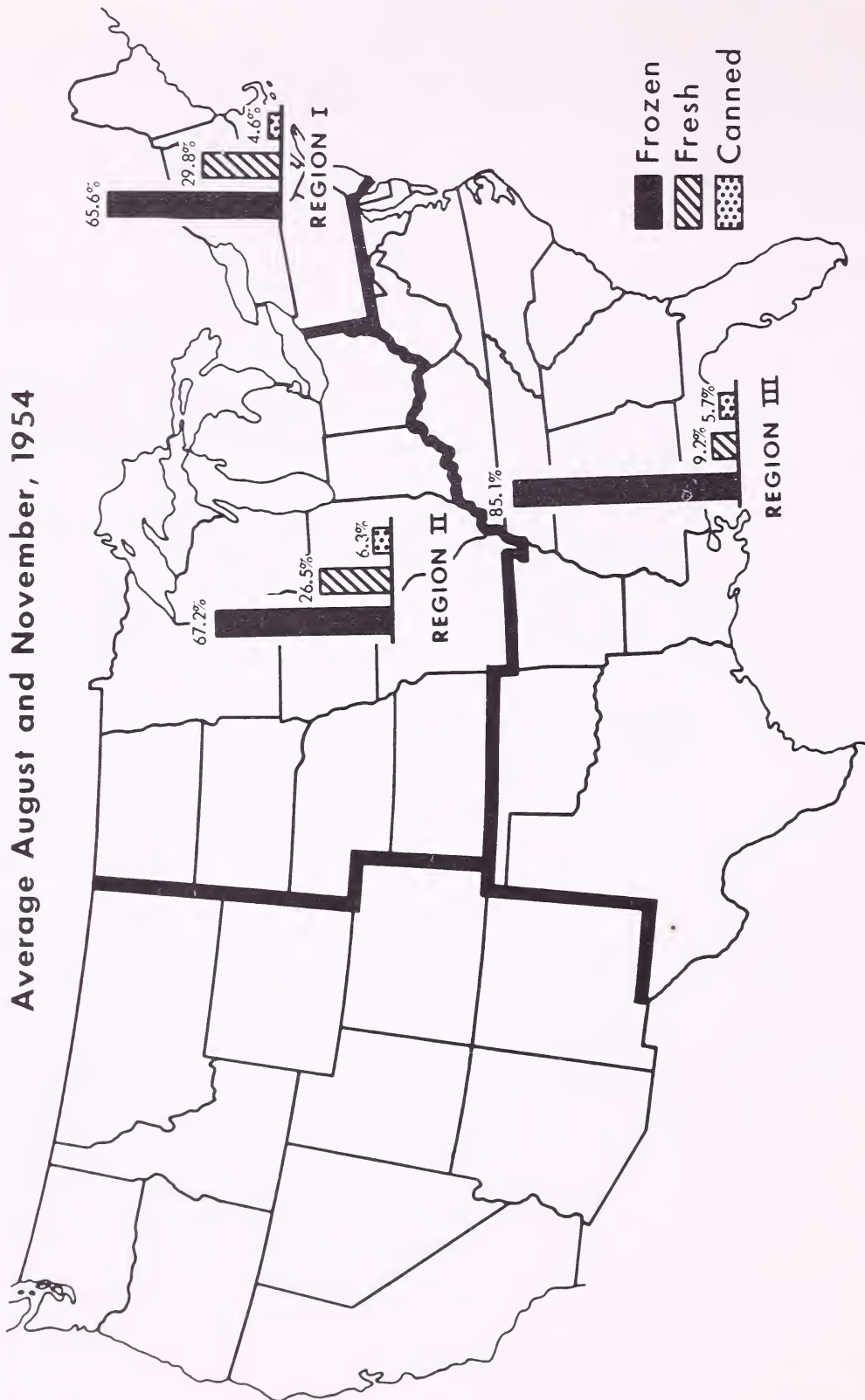
Frozen orange juice concentrate far exceeded the fresh and canned forms in each of the 3 regions (fig. 4). Region III used the highest proportion of their juice in frozen form. Canned orange juice was relatively insignificant in all regions. Juice from fresh oranges was of importance in regions I and II, but relatively unimportant in region III.

⁹ Based on Florida Cannery Association pack figures for 1953-54 season.

¹⁰ It is possible that some of the fresh oranges purchased by restaurants were used for purposes other than juice. However, since it is not possible to determine their utilization, the juice figures represent the total purchases of fresh oranges irrespective of use.

FORM IN WHICH ORANGE JUICE WAS PURCHASED BY RESTAURANTS

Average August and November, 1954



Poultry

Restaurants purchased about four-fifths of their chicken in fresh form and more than two-thirds of their turkey in frozen form. This generalization holds for each of the 3 regions included in the study. Purchases of frozen chicken and turkey were a higher proportion of total purchases in August than in November.

Apparently size of restaurant has little or no influence on the form in which restaurants purchase chicken or turkey (table 11). However, there is an indication that restaurants serving lower priced meals tended to purchase a higher proportion of their chicken in fresh or canned form and a lower proportion in frozen form than the restaurants serving the higher priced meals (table 12).

Table 11. --Relative quantity of chicken and turkey purchased by restaurants, by size of restaurant and by frozen, fresh, and canned form, August and November 1954

Item and month	Size A (6-11 employees)			Size B (12 or more employees)		
	Frozen	Fresh	Canned	Frozen	Fresh	Canned
Chicken	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
August.....	14.4	74.9	10.7	22.0	77.8	0.2
November.....	12.6	87.0	.4	18.8	81.2	0
Average	13.8	79.1	7.1	20.3	79.6	0.1
Turkey						
August.....	74.6	24.0	1.4	80.8	18.9	0.3
November.....	55.3	44.7	0	63.5	36.5	0
Average	64.1	35.3	.6	71.1	28.8	(1)

¹Less than 0.1 percent.

Table 12. --Relative quantity of chicken and turkey purchased by restaurants, by price of meals served and by form of purchase, August and November 1954

Item and month	Price of meal less than \$1			Price of meal \$1 and over		
	Frozen	Fresh	Canned	Frozen	Fresh	Canned
Chicken	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
August.....	13.2	78.3	8.5	24.0	75.9	0.1
November.....	13.0	87.0	(1)	20.1	79.8	0.1
Average	13.1	82.1	4.8	22.0	77.9	0.1
Turkey						
August.....	72.5	25.9	1.6	82.1	17.8	0.1
November.....	68.1	31.9	0	59.6	40.4	0
Average	69.8	29.5	0.7	70.0	30.0	(1)

¹Less than 0.1 percent.

Meats

Of the 588 restaurants in the study, 132 stated that they generally used meats that have been pre-cut or pre-formed to portion size and then frozen; 454 stated that they did not use them; 2 did not answer. Of the ones using frozen fabricated meats, they mention the following meats:

Meats	Number of restaurants using meats that have been cut into portion sizes and frozen ¹
Veal cutlets	73
Beef steaks (small) ...	62
Beef liver.....	50
Pork chops.....	38
Hamburger patties	11
Beef stew.....	8
Others.....	51

¹ Total is more than 132 because of multiple answers by restaurant operators.

Factors Affecting the Use of Frozen Foods by Restaurants

SIZE OF RESTAURANT

Size of restaurant appears to have a definite influence on the form in which fruits, vegetables, and orange juice are purchased (table 13). The larger sized restaurants (size B, 12 or more employees) purchased 37.0 percent of their vegetables in frozen form compared with only 11.5 percent for the smaller restaurants (size A, 6-11 employees). The larger-sized restaurants purchased 5 percentage points less in fresh form than the smaller restaurants. However, the larger restaurants purchased a much smaller proportion in canned form (33.7 percent) than the smaller restaurants (54.2 percent).

The same general relationships held on a regional basis. That is, within each region a higher proportion of frozen was used by the larger restaurants, the smaller restaurants purchased a slightly higher proportion of fresh and a much higher proportion of canned vegetables.

For fruits, the overall picture of proportion purchased by form was much the same as that for vegetables. However, there appeared to be a somewhat wider variation in the proportion purchased by form within regions as well as between regions for the 2 size groups of restaurants.

There were wide variations in the proportions of fruits and vegetables used by form by restaurants within the same region and size group (table 13). The larger sized restaurants in region II purchased 47.5 percent of their vegetables in canned form compared to only 20.2 percent of their fruit. Just as in region III, 55.8 percent of their fruit was purchased in canned form against 33.7 percent of their vegetables in canned form. This can be partially explained by the fact that region II (East and West North Central States) is located closer to the source of fruit production than region III (South Atlantic and East and West South Central). Conversely, region III is located in a fresh vegetable area, whereas, region II is not. It appears that both canned and frozen was substituted for fresh, depending upon the availability of fresh within the regions and the comparative price between forms. Information on prices paid by restaurants was not available for the period studied; no doubt they are significant determinants of the form used by restaurants.

Table 13.--Relative quantity of frozen, fresh, and canned vegetables, fruits, and orange juice purchased by restaurants grouped according to size by regions, average, August and November 1954 ¹

Commodity and region ²	Size A (6-11 employees)			Size B (12 or more employees)		
	Frozen	Fresh	Canned	Frozen	Fresh	Canned
Vegetables:	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
I.....	11.1	38.2	50.7	40.4	37.1	22.5
II.....	12.0	19.8	68.2	33.7	18.8	47.5
III.....	11.7	45.4	42.9	35.6	30.7	33.7
Average.....	11.5	34.3	54.2	37.0	29.3	33.7
Fruits:						
I.....	20.2	37.4	42.4	36.5	42.3	21.2
II.....	24.2	24.5	51.3	42.7	37.1	20.2
III.....	5.8	32.9	61.3	29.8	14.4	55.8
Average.....	18.1	31.2	50.7	36.7	32.9	30.4
Orange juice:						
I.....	58.9	31.9	9.2	68.0	29.1	2.9
II.....	69.7	17.1	13.2	66.3	29.7	4.0
III.....	59.7	11.7	28.6	89.5	8.8	1.7
Average.....	63.3	22.5	14.2	73.9	23.2	2.9

¹Based on fresh weight equivalent.

²Regions are shown in figure 1.

The larger restaurants used about the same proportion of orange juice in fresh form as the smaller restaurants. However, the larger restaurants did use a slightly higher proportion in frozen form than the small restaurants while the smaller restaurants purchased a higher proportion in canned form than the larger ones.

For each individual commodity included in the study the large restaurants purchased a higher proportion of each in frozen form than the smaller restaurants (table 14). The smaller restaurants purchased a higher proportion of each commodity in canned form than the larger restaurants. They also purchased a higher proportion of each vegetable in fresh form with the exception of corn and mixed vegetables. However, for fresh fruit, the smaller restaurants purchased a higher proportion of apples in fresh form while the larger restaurants purchased a higher proportion of peaches, cherries, and strawberries in the fresh form.

The above discussion has been concerned with the rate of use of frozen fruits and vegetables in relation to the use of fresh and canned forms within the 2 size groups of restaurants. Table 15 shows the relative number of restaurants purchasing individual fruits and vegetables by form within each size group. With the exception of mixed vegetables, the proportion of the larger sized restaurants purchasing fruits and vegetables in frozen form exceeded that of the smaller sized restaurants by a ratio of at least 2 to 1.

PRICE OF MEAL

Restaurants serving meals priced at \$1 and over purchase a larger proportion of total supplies in frozen form (table 16). While those restaurants serving meals priced less than \$1 used a higher proportion of canned fruits and vegetables, they purchased almost as high a proportion of frozen orange juice concentrate as did those in the group serving the higher priced meals.

Table 14.--Percentage of restaurants purchasing and relative quantity of frozen, fresh, and canned vegetables, fruits, and orange juice purchased, by restaurants, grouped according to size, average August and November 1954¹

Item	Size A (6-11 employees) ²				Size B (12 and over employees) ³				
	Percentage of restaurants purchasing in any form	Percentage purchased			Percentage of restaurants purchasing in any form	Percentage purchased			
		Frozen	Fresh	Canned		Total	Frozen	Fresh	Canned
Vegetable:	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Corn.....	61.8	11.5	34.3	54.2	100.0	37.0	29.3	33.7	100.0
Green beans.	70.7	6.5	22.6	70.9	100.0	27.0	24.7	48.3	100.0
Peas.....	68.4	4.3	25.4	70.3	100.0	19.8	21.6	58.6	100.0
Spinach.....	39.5	13.0	2.4	84.6	100.0	54.5	.5	45.0	100.0
Broccoli....	12.3	20.1	35.8	44.1	100.0	55.4	32.0	17.2	100.0
Carrots.....	55.7	54.6	45.4	---	100.0	87.8	12.2	---	100.0
Lima beans..	33.9	.5	77.1	22.4	100.0	5.4	73.0	21.6	100.0
Cauliflower.	15.7	35.8	23.5	40.7	100.0	69.7	7.2	23.1	100.0
Leafy greens ³	21.4	60.6	39.4	---	100.0	68.5	31.5	---	100.0
Asparagus...	8.6	9.4	54.5	36.1	100.0	29.8	51.0	19.2	100.0
Mixed.....	15.5	18.6	1.3	80.1	100.0	38.6	.2	61.2	100.0
Miscel-laneous ⁵ ...	---	34.3	.7	65.0	100.0	50.2	15.8	34.0	100.0
Fruit:	---	17.4	66.8	15.8	100.0	27.0	65.1	7.9	100.0
Apples.....	38.0	18.1	31.2	50.7	100.0	36.7	32.9	30.4	100.0
Peaches.....	15.2	14.8	42.9	42.3	100.0	29.8	40.0	30.2	100.0
Sour cherries...	38.4	6.2	26.6	67.2	100.0	15.7	37.3	47.0	100.0
Strawberries	15.7	43.8	.4	55.8	100.0	82.9	3.3	13.8	100.0
Orange juice..	---	86.1	---	13.9	100.0	93.9	5.0	1.1	100.0
	---	63.3	22.5	14.2	100.0	73.9	23.2	2.9	100.0

¹ Based on fresh weight equivalent.

² Based on records from 220 restaurants (6-11 employees).

³ Based on records from 242 restaurants (12 and over employees).

⁴ Leafy greens include kale, collards, and turnip greens.

⁵ Includes brussels sprouts, okra, field and blackeyed peas, squash, and succotash.

Table 15.--Percentage of restaurants purchasing vegetables and fruits by form, by size of establishment, average for August and November 1954.¹

Item	Size A (6-11 employees)				(Size B (12 and over employees)			
	In any form	Frozen	Fresh	Canned	In any form	Frozen	Fresh	Canned
Vegetable:	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Corn.....	61.8	9.5	15.2	45.9	65.1	21.9	15.9	40.5
Green beans.....	70.7	8.2	20.5	54.1	69.2	18.8	18.2	44.4
Peas.....	68.4	16.6	3.2	56.6	77.7	40.5	2.3	47.7
Spinach.....	39.5	11.6	8.4	23.4	55.4	26.0	16.1	20.0
Broccoli.....	12.3	10.5	2.3	---	32.9	28.3	5.8	---
Carrots.....	55.7	.9	42.7	16.8	58.1	4.1	45.9	17.1
Lima beans.....	33.9	13.6	6.1	17.0	50.6	37.4	5.2	13.6
Cauliflower.....	15.7	8.2	7.7	---	32.4	18.6	14.9	---
Leafy greens ²	21.4	2.3	11.8	10.0	17.8	5.4	10.1	5.2
Asparagus.....	8.6	3.0	.5	5.2	19.2	8.9	.2	11.2
Mixed ³	15.5	7.7	.2	7.5	14.7	8.5	2.3	3.9
Fruit:								
Apples.....	38.0	4.3	21.8	17.7	53.9	19.4	28.7	16.5
Cherries.....	15.2	4.8	.2	10.2	30.6	22.9	.8	9.1
Peaches.....	38.4	2.5	9.8	29.5	49.4	12.0	11.6	34.9
Strawberries.....	15.7	14.3	---	2.0	34.9	31.0	2.9	.8

¹ There were 220 restaurants in the size A group and 242 restaurants in the size B group. Percentage of restaurants purchasing each commodity by form add to more than percentage of restaurants purchasing "in any form" owing to multiform purchases.

² Includes kale, collards, and turnip greens.

³ Includes brussels sprouts, okra, field and blackeyed peas, squash, and succotash.

It appears that the restaurants serving the higher priced meals used a higher proportion of frozen vegetables at a loss to both fresh and canned vegetables compared with the purchases of the restaurants serving the lower priced meals. Those serving the lower priced meals used a higher proportion of fresh vegetables than did those serving the higher priced meals. For fruits, it is evident that those restaurants in the higher priced group purchased more in frozen form and less in canned form. There is very little difference in the proportion of fresh, frozen and canned orange juice used by the two groups of restaurants.

Table 16 also shows the regional distribution of the relative quantities purchased, by form, by price of meal served. There was extremely wide variation in the form in which fruits and vegetables were purchased by the 2 classes of restaurants, both within region and between regions. To illustrate this, within region I the lower priced restaurants purchased only 10.4 percent of their vegetables in frozen form, 50 percent fresh and 39.6 percent canned, while those serving the higher priced meals purchased 48.8 percent frozen, 29.5 percent fresh, and 21.7 percent canned.

Table 16. --Relative quantity of frozen, fresh, and canned fruits, vegetables, and orange juice purchased by restaurants, grouped according to price of meal, by regions, average for August and November 1954¹

Commodity by region ²	Meals under \$1.00			Meals \$1.00 and over		
	Frozen	Fresh	Canned	Frozen	Fresh	Canned
<i>Vegetables:</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
I.....	10.4	50.0	39.6	48.8	29.5	21.7
II.....	31.1	17.7	51.2	27.3	20.1	52.6
III.....	26.4	38.0	35.6	35.5	27.2	37.3
Average	22.5	35.6	41.9	39.0	25.8	35.2
<i>Fruits:</i>						
I.....	25.9	44.2	29.9	38.2	40.2	21.6
II.....	36.0	42.2	21.8	41.7	28.4	29.9
III.....	24.6	16.5	58.9	29.7	19.5	50.8
Average	28.6	32.2	39.2	38.3	33.0	28.7
<i>Orange Juice:</i>						
I.....	63.6	29.9	6.5	67.3	29.7	3.0
II.....	65.9	28.7	5.4	69.5	22.7	7.8
III.....	77.2	12.8	10.0	92.1	6.1	1.8
Average	67.9	25.2	6.9	75.1	20.9	4.0

¹ Based on fresh weight equivalent.

² Regions are outlined in figure 1.

In addition to variation in the proportion purchased by form within regions, there was extremely wide variation between the regions. The restaurants serving meals priced under \$1 in region I used 50 percent of their vegetables in fresh form compared with only 17.7 percent in fresh form and more than 50 percent in canned form for those in region II. For the restaurants serving the higher priced meals there was a decrease of more than 20 percentage points in the proportion used in frozen form between regions I and II. Region II was the only region in which a higher proportion of vegetables were used in frozen form by the restaurants serving the lower priced meals.

With few exceptions, restaurants serving meals priced at \$1 and over purchased a greater proportion of their specific fruit and vegetable supplies in frozen form (table 17). Restaurants serving the lower priced meals purchased a higher proportion of most fruits

and vegetables in fresh form. No pattern is apparent for the proportion of individual fruits and vegetables purchased in canned form by restaurants grouped according to price of meal.

Table 17. --Relative quantity of frozen, fresh, and canned fruits, vegetables, and orange juice purchased by restaurants, grouped according to price of meal, average for August and November 1954¹

Item	Meals under \$1.00			Meals \$1.00 and over		
	Frozen	Fresh	Canned	Frozen	Fresh	Canned
	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Vegetable:	22.5	35.6	41.9	39.0	25.8	35.2
Corn	17.3	29.6	53.1	26.7	19.1	54.2
Green beans.....	2.4	25.9	71.7	27.8	19.6	52.6
Peas	20.6	1.1	78.3	60.7	.8	38.5
Spinach.....	29.6	35.4	35.0	58.1	30.5	11.4
Broccoli.....	92.2	7.8	---	77.3	22.7	---
Carrots4	78.5	21.1	7.2	70.3	22.5
Lima beans	64.3	16.1	19.6	63.9	5.8	30.3
Cauliflower	60.3	39.7	---	71.3	28.7	---
Leafy greens ²	22.5	55.3	22.2	24.9	45.6	29.5
Asparagus	23.2	.5	76.3	42.9	.3	56.8
Mixed	24.2	5.6	70.2	56.0	12.9	31.1
Miscellaneous ³	20.4	70.2	9.4	31.6	59.0	9.4
Fruits:	28.6	32.2	39.2	38.3	33.0	28.7
Apples.....	18.4	42.7	38.9	37.3	38.0	24.7
Peaches	11.8	25.7	62.5	14.6	40.8	44.6
Sour cherries	79.2	3.7	17.1	75.4	1.9	22.7
Strawberries	93.8	3.3	2.9	92.1	5.0	2.9
Orange Juice:	67.9	25.2	6.9	75.1	20.9	4.0

¹ Based on fresh weight equivalent.

² Includes kale, collards, and turnip greens.

³ Includes brussels sprouts, okra, peas (field and blackeyed), squash, and succotash.

ATTITUDES OF RESTAURANT OPERATORS TOWARD THE USE OF FROZEN FOODS

The attitudes of 588 restaurant operators toward frozen vegetables, fruits, and juices were ascertained to determine what factors to consider when judging the merits of these items against those of canned and fresh. In analyzing the data gathered, we attempted to categorize the reasons given for using frozen products into 4 groups of factors: Convenience factors, quality factors, cost factors, and others. In addition, we grouped the reasons given for not using frozen vegetables according to central tendencies and frequency mentioned.

It appears that the restaurant operators tend to compare the quality of frozen products with that of fresh products, while generally they tend to compare the price of the frozen product with that of the canned product. In addition it appears that the restaurant operators are in general agreement that frozen and canned products are more convenient to use than the fresh form.

Responses of restaurant operators who were asked whether they generally used frozen vegetables, fruits, juice, poultry, and meat are given in table 18. The reasons mentioned for using vegetables, fruits, and juices in frozen form are shown in table 19.

Two-thirds of the restaurant operators mentioned convenience factors at least once as a reason for using vegetables, fruits, and juice in frozen form. About half of the operators mentioned quality factors for each of the three categories at least once, while about two-fifths mentioned cost factors.

Generally for each category--vegetables, fruits, and juice--the reasons mentioned most often have to do with the time- and labor-saving aspects of frozen form compared with the fresh form. Other reasons mentioned often dealt with the flavor of frozen approximating that of fresh and exceeding that of canned, availability throughout the year, and the fact that most frozen items can readily be substituted for fresh items.

The reasons restaurant operators gave for not using frozen vegetables, fruits, and juices are shown in table 20. Lack of storage space and price are the predominant reasons given.

Table 18.--Proportion of restaurant operators who stated that they generally used frozen vegetables, fruits, juices, poultry, and meats in their operations, August 1954¹

Item	Frozen	Not using frozen	Total
	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Vegetables	43	57	100
Fruits	38	62	100
Juices	43	57	100
Poultry	53	47	100
Meats	22	78	100

¹Includes 588 restaurants.

Table 19.--Reasons given by restaurants for using frozen fruits, vegetables, and juices, August 1954

Reasons	Vegetables		Fruits		Juices	
	Restaurants mentioning ¹	Percentage of total ²	Restaurants mentioning ¹	Percentage of total ²	Restaurants mentioning ¹	Percentage of total ²
	<i>Percent</i>	<i>Percent</i>	<i>Number</i>	<i>Percent</i>	<i>Number</i>	<i>Percent</i>
Convenience factors.....	---	66	---	69	---	69
Easier to prepare than fresh, quicker to prepare, saves time	129	---	71	---	132	---
Availability	45	---	71	---	13	---
Used as substitute when fresh not available	37	---	19	---	10	---
Easier to store than fresh ..	10	---	17	---	31	---
Can be purchased in smaller quantities than fresh	---	---	5	---	---	---
Can use only amount needed.	20	---	---	---	---	---
Don't have to buy daily as with fresh.....	4	---	---	---	---	---
Easy to serve	3	---	6	---	11	---
Convenient to have on hand..	---	---	20	---	43	---

See footnotes at end of table.

Table 19.--Reasons given by restaurants for using frozen fruits, vegetables, and juices,
August 1954--Continued

Reason	Vegetables		Fruits		Juices	
	Restau- rants mention- ing ¹	Per- centage of total ²	Restau- rant mention- ing ¹	Per- centage of total ²	Restau- rant mention- ing ¹	Per- centage of total ²
Convenience factors (Cont'd)						
Cleaner than fresh, already cleaned.....	Number ---	Percent ---	Number 8	Percent ---	Number 15	Percent ---
Can be used many ways-- pies, sundaes, etc.	---	---	14	---	---	---
Quality factors	---	62	---	50	---	59
Flavor closer to fresh than canned, tastes fresh	63	---	24	---	18	---
Better taste than canned, better flavor.....	49	---	31	---	36	---
Flavor as good as fresh, as good as fresh.....	30	---	73	---	47	---
Good appearance.....	37	---	14	---	---	---
Better color when cooked than fresh	10	---	---	---	---	---
Standardization of quality...	23	---	8	---	49	---
Good quality.....	10	---	21	---	---	---
Color and flavor good	---	---	21	---	11	---
Better than fresh	---	---	5	---	26	---
Cost factors.....	---	42	---	41	---	51
Eliminates much labor, labor saving.....	64	---	47	---	53	---
More economical than fresh.	19	---	21	---	43	---
Cheaper than fresh.....	19	---	4	---	23	---
No waste, less waste than fresh.....	15	---	29	---	20	---
Just as cheap as fresh in season.....	---	---	4	---	---	---
Less storage space	---	---	---	---	12	---
Profitable.....	---	---	---	---	6	---
Other factors						
Prefer fresh vegetables, but save frozen as second choice	13	---	---	---	---	---
Like frozen better	10	---	---	---	---	---
Customers prefer frozen more than any other.....	15	---	---	---	---	---
Use only in pies	---	---	38	---	---	---
Use fresh in season.....	---	---	9	---	---	---
Customers like them.....	---	---	6	---	24	---
Miscellaneous	30	---	15	---	35	---
Number of restaurants answering	255	---	222	---	250	---

¹ Number of reasons add to more than total number of restaurants answering the question owing to multiple answers.

² Percentages of total number restaurants that mentioned convenience, quality, and/or cost factors at least once as a reason for using frozen vegetables, fruits, and juices. Totals add to more than 100 owing to multiple answers.

Table 20.--Reasons given by restaurants for not using frozen vegetables, fruits, and juices, August 1954¹

Reasons	Vegetables	Fruits	Juices
Convenience	<i>Number</i>	<i>Number</i>	<i>Number</i>
Canned is more convenient than frozen, too much trouble to prepare	40	---	20
Canned is quicker to prepare than frozen	17	---	7
Fresh is available most of the time	12	20	12
Easier to handle canned or fresh than frozen..	7	18	---
Less work to opening cans	6	---	46
Frozen has to be thawed	4	10	9
Quantities too large	---	6	---
Quality			
Fresh is better than frozen, fresh is more appealing	39	36	47
Customers prefer fresh	39	7	---
Don't like taste of frozen	29	22	---
Prefer fresh and canned	29	---	114
Must be used at once, loses it flavor if thawed	15	---	25
Frozen loses quality on steam table	14	---	---
Frozen not as tasty as fresh or canned	11	---	---
Frozen loses its firmness, mushy	---	11	---
Canned is better	---	9	10
Frozen lacks flavor	---	5	---
Taste too artificial	---	---	13
Separates if allowed to stand	---	---	5
Quality of frozen not standard	3	4	---
Cost			
Price of frozen high, too expensive	50	67	20
Fresh in season costs less than frozen	48	---	---
Canned is cheaper than frozen	46	22	15
Frozen too expensive for reasonable profit ...	37	---	---
More expensive and not as good as fresh	---	12	---
Takes expensive storage space	12	8	7
Too much waste	---	4	9
Other			
No storage space, no freezer	93	52	34
Foreign restaurant, does not generally use ...	---	63	12
Use very little fruit of any kind	---	52	---
Some not available in frozen form	---	---	27
Never thought of using frozen	15	---	---
Customers don't demand frozen	9	54	31
Don't serve cooked vegetables	8	---	---
Don't like frozen	5	---	14
Not available, don't know, and seldom use....	26	14	33
Miscellaneous	15	26	4
Number of restaurants answering questions.	333	336	338

¹ Number of reasons exceeds number of restaurants because some restaurants gave multiple answers.

PROJECTIONS OF FROZEN FOOD USAGE BY RESTAURANTS

In order to make projections as to the future role of frozen foods in the restaurant industry it is necessary to determine first the current usage of frozen foods and then to analyze current trends. Projections of food usage by restaurants should be useful in making estimates for future storage and handling facility requirements. Certain basic assumptions in regard to the behavior of the economy are implicit in any projection of food usage. The assumptions upon which this projection is based are:

1. The economy will maintain a relatively full level of employment.
2. Price levels will remain relatively stable.
3. The economy will grow much as it has in the past.

Granted these assumptions, the three important factors affecting future frozen food usage by the restaurant industry appear to be population growth, level of personal disposable income, and competition between fresh and canned items. Projected income and population growth are used as the basis for the following projections of frozen food growth. It is recognized, however, that changing patterns of competition among frozen, fresh, and canned items may also significantly affect the use of frozen foods by the restaurant industry.

Income

According to the 1948 survey of food consumption by urban families¹¹ the level of family disposable income appears to exert several influences on meals purchased away from home:

1. The percentage of families buying meals away from home tended to increase rapidly as family incomes increased up to the \$6,000 level.
2. Those individuals purchasing meals away from home tend to buy more meals as individual incomes rise.
3. Families in the higher income groups spend more for the meals they purchase.

The relationship between income and percentage of families buying meals, number of meals purchased, and average price of meal purchased away from home are shown in table 21. The average number of meals purchased rose from 0.43 per capita per week for the income group under \$1,000 to 2.42 meals per week for the group over \$7,500. There is a positive relationship between the number of meals purchased and income, but the most rapid rise occurred between the \$2,000 and \$5,000 family income levels (fig. 5).

The percentage of families purchasing meals away from home also rose more rapidly between the \$2,000 and \$5,000 income levels. Additional income above the \$6,000 level appeared to have less influence either upon the percentage of families buying or the number of meals purchased (table 21).

As incomes rose, the prices paid for meals eaten away from home also increased. The average price of meals purchased away from home ranged from 24 cents for families with incomes under \$1,000 in 1948 to \$1.06 for families having incomes in excess of \$7,500 (table 21).

There are several important implications which might be made from the above relationship between family income levels and the purchase of meals. It would appear that as families move from the lower income category into the middle class buying group there

¹¹ Food Consumption of Urban Families in the United States, U. S. Dept. Agr. Inform. Bul. 132, 1954.

should be: (1) More meals sold in restaurants as this shift continues; and (2) more of the higher priced meals would be sold. These shifts should occur aside from any increase associated with the growth in population. Both of these trends should increase the amount of frozen foods used by restaurants.

This study has shown that restaurants use relatively more of their fruits and vegetables in the frozen form than is true for the overall market. Any shift of meals from the home to the restaurant should tend to increase the relative share of frozen products.

The findings of this study also show that as the price of meals increases, relatively more of the frozen fruits and vegetables tend to be used at the expense of both the fresh and canned forms in case of vegetables and at the expense of canned alone in case of fruits.

Table 21. --Number of meals purchased away from home per capita, percentage of families purchasing meals away from home, and average price paid per meal, by income before and after taxes, spring (April-June) 1948¹

Family income in 1947		Meals purchased away from home in a week per capita	Percentage of families purchasing meals away from home	Average price paid per meal
Before taxes	Average after taxes			
		<i>Number</i>	<i>Percent</i>	<i>Dollars</i>
Under \$1,000	\$610	0.43	20.8	\$0.24
\$1,000-\$1,999	1,555	.44	21.6	.21
\$2,000-\$2,999	2,505	.75	42.9	.42
\$3,000-\$3,999	3,485	1.01	51.6	.49
\$4,000-\$4,999	4,421	1.50	68.3	.47
\$5,000-\$7,499	5,861	2.14	78.4	.74
\$7,500 and over	11,766	2.42	86.1	1.06

¹ Food Consumption of Urban Families in the United States, U. S. Dept. Agr. Inform. Bul. 132, 1954, p. 59.

Since 1947 there has been a significant shift in family incomes from lower to higher income groups. The number of families with incomes in excess of \$5,000 has more than doubled since 1947. By 1955 about 41 percent of the families had incomes in excess of \$5,000.¹² The decrease in lower incomes and the increase in higher incomes is shown in table 22. During this same period of time the production of frozen vegetables for the institutional market more than doubled, and frozen fruit production destined for this market quadrupled.

What are the prospects that income will increase in the future? The Agricultural Marketing Service has prepared projections as to the per capita disposable personal income by 1975.¹³ This projection shows that disposable income is expected to increase by 58 percent between 1953 and 1975 (fig. 6). In 1953 the average family consisted of 3.4 members,¹⁴ had a disposable family income of \$5,260. By 1975, this same sized family would have an income of \$8,327, or 58 percent increase in disposable income. This projection assumes no increase in price level. If this expected increase in disposable income by 1975 is realized there should be a larger proportion of families purchasing meals away from home, they should buy more meals per person (table 23), and at a higher price per meal.

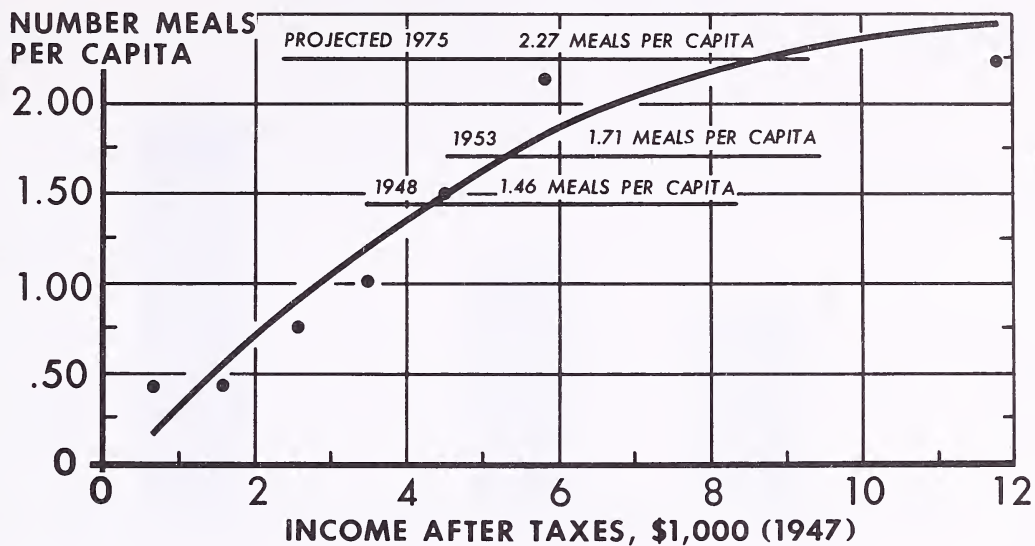
¹² No consideration is given to the effect of change in price level between 1948 and 1955.

¹³ Daly, Rex F., The Long-Run Demand For Farm Products, Agr. Econ. Res., July 1956, table 1.

¹⁴ 1953 population per household was 3.4 as reported by 1954 Statistical Abstract.

MEALS PURCHASED AWAY FROM HOME PER CAPITA PER WEEK

By Income, 1948, 1953, and Projection for 1975



U. S. DEPARTMENT OF AGRICULTURE

NEG. 3513-56 (9) AGRICULTURAL MARKETING SERVICE

FIGURE 5

Table 22. --Percentage change in income distribution of families and unattached individuals at specified income levels, 1947 and 1955

Income (before taxes)	Families and unattached individuals		Percentage change, 1947-1955
	1947	1955	
	<i>1,000 dollars</i>	<i>1,000 dollars</i>	<i>Percent</i>
Under \$1,000	3,748	3,000	-20.0
\$1,000-\$1,999	7,370	5,300	-28.1
\$2,000-\$2,999	8,459	6,200	-26.7
\$3,000-\$3,999	8,628	7,100	-17.7
\$4,000-\$4,999	5,725	7,600	+32.8
\$5,000-\$5,999	3,474	6,500	+87.1
\$6,000-\$7,499	3,151	6,300	+99.9
\$7,500-\$9,999	2,170	4,900	+125.8
\$10,000-\$14,999	1,199	2,200	+83.5
\$15,000 & over.....	816	1,500	+83.8
Total.....	44,740	52,200	---

Survey of Current Business, U. S. Department of Commerce, June 1956.

PER CAPITA DISPOSABLE PERSONAL INCOME

1948, 1953, and Projection for 1975

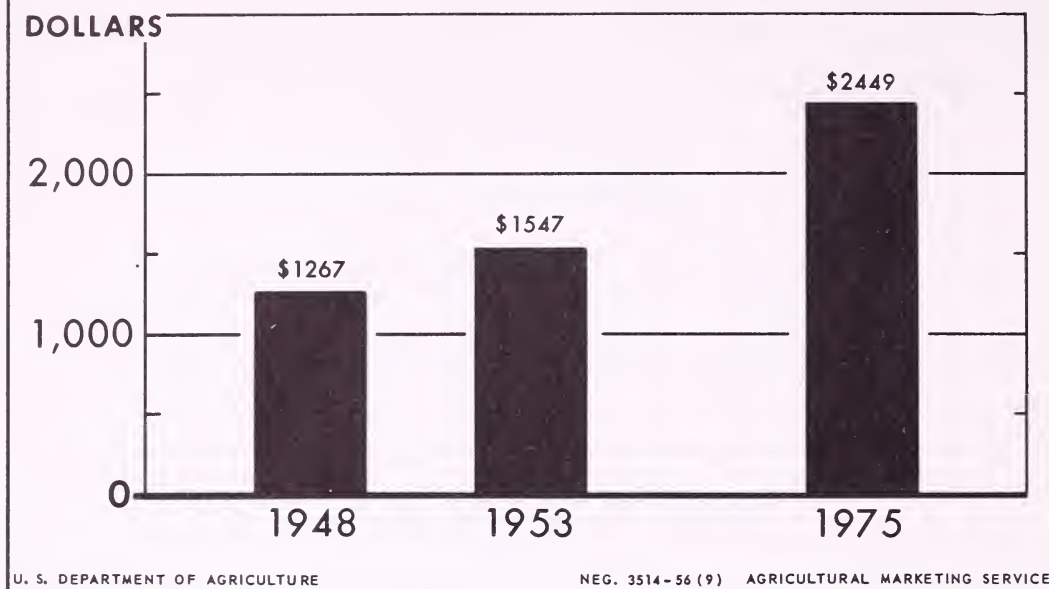


FIGURE 6

Population

Population growth is another important factor affecting the number of meals purchased away from home. Between 1947 and 1953 there was a 10.8-percent increase in population. Assuming that the family purchasing habits for meals purchased away from home in relation to income levels found in 1948 continue, there would have been a 30-percent increase in total number of meals purchased away from home between 1947 and 1953. This increase takes into account both the 10.8-percent increase in population between 1947 and 1953 and the shifts which have occurred in family income levels. This relationship is shown in table 24.

Table 23. --Disposable income and per capita number of meals purchased away from home, per week, 1948, 1953, and projected 1975

Year	Disposable income		Meals purchased away from home per week	
	Per capita	Family ¹	Per capita ²	Percentage increase
	<i>Dollars</i>	<i>Dollars</i>	<i>Number</i>	<i>Percent</i>
1948.....	1,262	4,291	1.46	---
1953.....	1,546	5,256	1.71	17
1975 ³	⁴ 2,449	8,327	2.27	33

¹ Members per family, 3.4.

² The number of meals purchased away from home was estimated by comparing the family disposable income for 1948, 1953, and 1975 (projected) with the 1948 consumption pattern of the number of meals purchased away from home at specific income levels. Source of 1948 consumption data: Food Consumption of Urban Families in the United States, U.S. Dept. Agr., Inform. Bul. 132, 1954.

³ Projected.

⁴ Daly, Rex F., The Long-Run Demand for Farm Products. Econ. Res., July 1956, table 1.

Table 24. --Disposable per capita income, population, and total number of meals purchased away from home per week, 1948, 1953, and projected 1975

Year	Disposable family income ¹	Population	Meals purchased away from home	
			Per week	Percentage increase
	<i>Dollars</i>	<i>Millions</i>	<i>Millions</i>	<i>Percent</i>
1948.....	4,291	146.1	213.3	---
1953.....	5,256	161.9	276.8	30
1975 ²	8,327	214.6	487.1	76

¹ Members per family, 3.4.

² Projected.

The Bureau of Census has prepared estimates of the future population of the United States, which are based on the expected rates of growth after 1955.¹⁵ There are four series of projections for 1975 with population estimates ranging from 206.9 million to 228.5 million. The projection of number of meals purchased away from home is based on the estimated population of 214.6 million persons for 1975.

Effect of Income and Population Changes on Number of Meals Purchased Away From Home

What effect will a population of 214.6 million people and an average family disposable income of \$8,327 by 1975 have upon the number of meals purchased away from home? If the 1948 pattern of meals purchased away from home (fig. 5) remains unchanged, there should be a 76 percent increase in the number of meals purchased away from home by 1975 (table 24). Of this increase, 57 percent may be attributed to the increase in population and 43 percent to the increase in disposable incomes.

How Will the Increase in Number of Meals Purchased Away From Home by 1975 Affect the Demand for Frozen Vegetables and Fruits?

Based on the 76 percent increase in number of meals purchased away from home by 1975, the amount of frozen vegetables packed in institutional-size containers (more than 1 pound through 10 pounds) should increase to 366 million pounds. This is an increase of about 158 million pounds over that packed in this category in 1953. The increase in this segment of the frozen vegetable pack alone could account for a 14 percent increase in the total frozen vegetable pack by 1975.

The increase in number of meals purchased away from home by 1975 would indicate that 52 million pounds of fruit will be needed for the institutional market alone. This amounts to an increase of 23 million pounds more than was produced in 1953--a 4 percent increase in the total frozen fruit pack.

The above projections of the frozen fruit and vegetable packs for the institutional market may be considered as lower limits by 1975. The findings of this study would indicate that the use of frozen foods by restaurants could be expected to be even greater than that called for by population growth and increase in disposable income. The trend toward higher priced meals and larger sized restaurants both should tend to increase the use of frozen foods.

¹⁵ Current Population Reports, Population Estimates, U. S. Department of Commerce, Series P-25, No. 123, October 1955.

It has been demonstrated that restaurants serving the higher priced meals (\$1 or more) used a higher proportion of their fruits and vegetables in frozen form. The study shows that restaurants serving the higher priced meals purchased 39 percent of their vegetables in frozen form, compared to 22.5 percent for those serving meals priced under \$1.00. For fruits, 38.3 percent was purchased in frozen form by the higher priced restaurants, compared to 28.6 percent for those serving the lower priced meals. This relationship, considered along with the expectations of higher family incomes shifting a larger proportion of the families into a category consuming the higher priced meals, leads to the logical conclusion to expect increased use of frozen fruits and vegetables over and beyond the above projection.

This study has also shown that the size of restaurant has a definite influence on the usage of frozen fruits and vegetables by restaurants. The larger sized establishments (12 or more employees) use a higher proportion of vegetables in frozen form--37.0 percent, compared to 11.5 percent for the smaller-sized restaurants (6-11 employees). For fruits, the larger sized units purchased 36.7 percent in frozen form, compared to 18.1 percent by the smaller-sized units. Currently, the trend is toward the larger sized restaurants. A preliminary report of the 1954 Census of Business shows there was a 43-percent increase in total sales of restaurants and cafeterias from 1948-54.¹⁶ The sales increase was accompanied by a 5-percent increase in number of establishments, which, in turn, represents about a 37-percent increase in sales for individual establishments. This trend toward larger sized establishments should call for additional increases in the frozen fruit and vegetable pack.

An increase in larger sized restaurants implies both an increase in the number of restaurants using frozen foods and an increase in the rate of use by those using frozen foods. Additional impetus toward the use of frozen foods by restaurants might also be generated by the trend toward portion-controlled foods.¹⁷

¹⁶Preliminary Report 1954 Census of Business, Retail Trade, Bureau of the Census, U. S. Department of Commerce, June 11, 1956. Data for restaurants and cafeterias include figures for in-plant food contractors, since these data could not be separated.

¹⁷Portion-controlled foods are defined as foods that have been processed into uniform portion sizes. This enables the restaurant operator to serve uniform portions, cut preparation time, and keep more accurate inventory control.

APPENDIX

Sample Design

A random sample of 24 cities was drawn on the basis of population stratified according to the following schedule:

Population	New England and Middle Atlantic	East and West North Central	South Atlantic East and West South Central
Over 900,000.....	3	3	0
250,000 to 900,000.....	3	3	3
50,000 to 249,999.....	3	3	3
Total	9	9	6

The following cities were included in the sample:

New England and Middle Atlantic States

1. New York, N. Y.
2. Philadelphia, Pa.
3. Baltimore, Md.
4. Boston, Mass.
5. Rochester, N. Y.
6. Jersey City, N. J.
7. Springfield, Mass.
8. Harrisburg, Pa.
9. East Orange, N. Y.

East and West North Central States

10. Cleveland, Ohio
11. Detroit, Mich.
12. Chicago, Ill.
13. Pittsburgh, Pa.
14. St. Louis, Mo.
15. Kansas City, Mo.
16. Grand Rapids, Mich.
17. Racine, Wis.
18. Des Moines, Iowa

South Atlantic, East and West South Central States

19. Memphis, Tenn.
20. Dallas, Tex.
21. Birmingham, Ala.
22. Savannah, Ga.
23. Tampa, Fla.
24. Chattanooga, Tenn.

A random listing of names and addresses of public eating and drinking places within each city or county in which the city was located was obtained from the U. S. Department of Health, Education, and Welfare, Bureau of Old Age and Survivors Insurance. The listing was separated by size of establishment: (1) Those with 6-11 employees; and (2) those with 12 or more employees. A probability sample of 10 restaurants and cafeterias

was selected from each of the employee-size groups, giving a sample quota of 20 establishments in each city or 480 establishments in the 24 cities. When possible, each city was oversampled by 25 percent in order to insure full coverage.

Table 25.--Percentage distribution of restaurant purchases of selected fruits, vegetables, and juice, by frozen, fresh, or canned form, average for August and November 1954, within regions ¹

Commodity	Frozen			Fresh			Canned		
	Region I	Region II	Region III	Region I	Region II	Region III	Region I	Region II	Region III
Vegetable:	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Corn	27.4	16.2	24.8	28.4	17.0	32.1	44.2	66.8	43.1
Green beans.....	30.3	9.5	4.6	23.8	9.0	36.2	45.9	81.5	59.2
Peas.....	59.7	38.5	20.0	0.6	0.1	3.8	39.7	61.4	76.2
Spinach.....	47.3	40.2	45.9	41.1	32.9	8.9	11.6	26.9	45.2
Broccoli.....	68.3	90.9	96.2	31.7	9.1	3.8	---	---	---
Carrots.....	5.9	1.2	2.1	76.9	63.0	85.8	17.2	35.8	12.1
Lima beans	71.2	56.3	63.8	11.6	4.2	13.4	17.2	39.5	22.8
Cauliflower	53.2	77.1	81.0	46.8	22.9	19.0	---	---	---
Leafy greens ² ...	6.3	---	25.1	90.1	55.4	49.2	3.6	44.6	25.7
Asparagus.....	22.2	53.0	11.8	---	0.7	0.1	77.8	46.3	88.1
Mixed.....	50.2	40.7	36.9	21.9	---	---	27.9	59.3	63.1
Miscellaneous ³ ..	15.8	49.9	25.8	78.1	41.6	60.1	6.1	8.5	14.1
Fruit:									
Apples.....	31.2	30.2	20.3	47.1	55.4	17.6	21.7	14.4	62.1
Peaches	11.8	16.3	12.3	50.0	22.8	26.2	38.2	60.9	61.5
Sour cherries ...	84.7	78.8	65.9	---	5.3	0.2	15.3	15.9	33.9
Strawberries....	95.5	91.8	89.3	2.0	5.9	6.1	2.5	2.3	4.6
Orange juice....	65.6	67.2	85.1	29.8	26.5	9.2	4.6	6.3	5.7

¹Based on fresh weight equivalent.

²Includes kale, collards, and turnip greens.

³Includes brussels sprouts, okra, field and blackeyed peas, squash, and succotash.



